## REMARKS

Review and reconsideration on the merits are requested in view of the foregoing amendments and the following discussion.

In the first rejection, claims 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite, because it is not clear whether the amounts are with respect to the wire or the core. In response to the rejection, each of the claims setting forth the amount of an element has been amended to expressly state that amount cited is based upon the total weight "of the wire." This change is supported by the disclosure at line 4 of page 6 of the application. In view of this amendment, the applicant respectfully submits that the rejection under 35 U.S.C. 112 can be withdrawn.

In the second rejection, claims 1-5, 7, and 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious in view of Kulikowski et al. US Pat. 5,369,244. In making this rejection, the Office is overlooking a critical distinction between the fill material defined in claim 1 and the fill material taught in Kulikowski et al. The fill material in the welding electrode of the invention contains a **composite particle**; the Kulikowski et al. electrode does not. The **composite particle** used in the claimed invention is instrumental in reducing manganese fumes released in the welding process.

Kulikowski et al. provides a T1 type electrode having crack resistance normally associated with a T5 type electrode. Another object of Kulikowski et al. is the production of low hydrogen and oxygen content in the resulting weld bead. Kulikowski et al. uses polytetrafluoroethylene, or Teflon powder, as an essential element of the electrode. According to Kulikowski et al., the polytetrafluoroethylene (Teflon) is disassociated to produce flourine, which then combines with hydrogen to produce hydrogen flouride. This is the process by which hydrogen contamination in the weld bead is reduced thereby resulting in a reduction of hydrogen fumes. Kulikowski et al. says nothing about reducing manganese fume, nor does it say anything about a manganese-containing composite particle.

Applicant's invention relies upon a **composite manganese-containing particle**, which is not taught in Kulikowski et al. The composite particle typically contains manganese encapsulated with a shielding material. Another embodiment of the composite particle is an

agglomerate of manganese with the shielding material. In both cases the manganese is **intimately associated** with a shielding material and is **not a simple admixture**. It is the presence of this **composite particle**, which reduces the harmful manganese fumes associated with welding. As explained in the first full paragraph on page 4 of the application, tests were performed with the same amount of manganese in the wire, while adjusting the percentage of manganese-containing composite particles from 25 to 50 to 75% composite particles in the core composition with each respective test. As shown in Figure 4 in the application, studies showed that as the amount of composite particles was increased, the amount of manganese in fume decreased up to 36%. Thus, the reduction in fumes is attributed to the presence of manganese-containing composite particles in the core. Thus, as explained in the application, **by intimately associating the manganese in a composite particle**, the manganese is not readily oxidized upon welding, the manganese is prevented from vaporizing, and manganese oxide vapor is reduced.

In summary, because Kulikowski et al. does not teach manganese-containing composite particles nor does Kulikowski et al. teach reducing manganese fume, Kulikowski et al. cannot teach or suggest the claimed invention and the rejection must fail.

In the third rejection, claims 6 & 9-11 are rejected under 35 U.S.C. 103(a) as being obvious in view of Kulikowski et al. The examiner states that the compositions closely approximate or overlap applicant's claimed composition in range. The applicant submits that these claims are patentable for the reasons already stated.

In view of the foregoing reasons, the applicant respectfully requests that the rejections under 35 U.S.C. 102/103 be withdrawn and that this case receive favorable action on the merits.

Respectfully submitted,

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Amendment
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**MARKED UP VERSION OF AMENDMENTS**

Paragraph beginning on page 3, line 21 (Amended)

Fig. 2 illustrates a typical admixed particle 60 in which particles of manganese 64 are embedded in a matrix of the shielding material 62. These particles can vary in structure. The particles 60 shown in Fig. 2 include manganese particles [62] 64 that extend from the surface to the structure. In Fig. 3, the particle 60 has an encapsulated structure in which a manganese particle 64 is coated with the shielding material 62. A composite particle structure is also possible in which multiple capsules agglomerate to produce the polycapsular particles. Those skilled in the art will recognize that the structure of the composite particle can be adjusted by varying the amount and particle size of the manganese and shielding material as well as varying the process used to create the admixture.

4. (Amended) The electrode of claim 3 wherein the shielding materials is rutile.

10. (Amended) The electrode of claim 1 wherein the electrode is formulated for welding on mild steel and has the following composition in approximate percent by weight of the wire.

| Constituent | Mild Steel |
|---|---|
| C | 0.0-0.12 |
| Mn | 0.5-3.0 |
| Si | 0.0-2.0 |
| Ti | 0.05-0.7 |
| B | 0.0-0.1 |
| Cr | 0.0-0.4 |
| Ni | 0.0-0.5 |
| Mo | 0.0-0.1 |
| V | 0.0-0.5 |
| Al | 0.0-0.5 |
| Cu | 0.0-0.1 |
| Mg | 0.0-0.5 |
| Fe | 01.48-99.45 |



11. (Amended) The electrode of claim 1 wherein the electrode is formulated for welding on low alloy steel and has the composition in approximate percent by weight of the wire.

| Constituent | Low Alloy |
|---|---|
| C | 0.0-0.13 |
| Mn | 0.5-3.75 |
| Si | 0.0-2.0 |
| Ti | 0.05-0.7 |
| B | 0.0-0.1 |
| Cr | 0.0-10.5 |
| Ni | 0.0-3.75 |
| Mo | 0.0-1.2 |
| V | 0.0-0.25 |
| Al | 0.0-0.5 |
| Cu | 0.0-0.75 |
| Mg | 0.0-0.5 |
| Fe | 75.87-99.45 |

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